

GOVERNMENT OF INDIA  
 METEOROLOGICAL DEPARTMENT

# INDIA WEATHER REVIEW, 1942

## ANNUAL SUMMARY PART C STORMS AND DEPRESSIONS

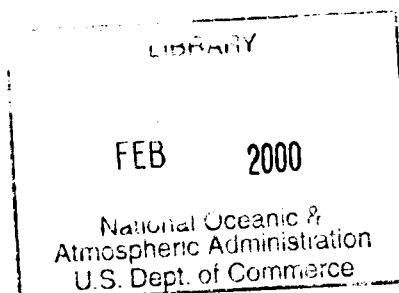
### CONTENTS

	Page.		Page.
Depressions and Cyclonic Storms . . . . .	C 1	Local Storms . . . . .	C 9
Western Disturbances . . . . .	C 8		

Published by the Authority of the Government of India

UNDER THE DIRECTION OF

S. K. Banerji, M.Sc., D.Sc., O.B.E.,  
*Director General of Observatories*



PUBLISHED BY THE MANAGER OF PUBLICATIONS, DELHI  
 PRINTED BY THE MANAGER, GOVERNMENT OF INDIA PRESS, CALCUTTA  
 1945

Price Rs. 2-8 or 4s.

# **National Oceanic and Atmospheric Administration**

## **Environmental Data Rescue Program**

### **ERRATA NOTICE**

One or more conditions of the original document may affect the quality of the image, such as:

Discolored pages

Faded or light ink

Binding intrudes into the text

This document has been imaged through the NOAA Environmental Data Rescue Program. To view the original document, please contact the NOAA Central Library in Silver Spring, MD at (301) 713-2607 x124 or [www.reference@nodc.noaa.gov](mailto:www.reference@nodc.noaa.gov).

Information Manufacturing Corporation  
Imaging Subcontractor  
Rocket Center, West Virginia  
September 14, 1999

# INDIA WEATHER REVIEW, 1942

## ANNUAL SUMMARY

### PART C

#### STORMS AND DEPRESSIONS

##### I.—DEPRESSIONS AND CYCLONIC STORMS.

During the year 5 cyclonic storms and 7 depressions formed in the Bay of Bengal, 2 depressions in the Arabian Sea and 2 depressions over land. The dates of activity of the storms and the greatest barometric depths observed in them are summarised in the table below :—

Locality.	Month.	Date.	Greatest observed barometric depth.
Bay of Bengal . . . .	June . . . . .	3rd—5th . . . . .	0·12"
Ditto . . . . .	July . . . . .	8th—13th . . . . .	0·44"
Ditto . . . . .	October . . . . .	14th—18th . . . . .	1·20"
Ditto . . . . .	October—November . . . . .	27th October—5th November . . . . .	0·26"
Ditto . . . . .	November . . . . .	13th—17th . . . . .	0·76"

The detailed descriptions of these storms and depressions are followed by a list of western disturbances and the more important local storms during the year.

1. **Western depression of the 18th to 21st February, 1942.**—A western disturbance which was affecting the Persian Gulf gave rise on the 16th February to a secondary in the Gulf of Oman and neighbourhood. The evening chart of the 16th indicated that the primary in the Persian Gulf was moving north-eastwards, but the secondary was practically stationary causing overcast skies and rainfall in the Gulf of Oman, Jask reporting 3" of rain in the 24 hours ending 8 hrs. of the 17th. The secondary intensified during the 17th, and became a depression with centre about 60 miles east of Ras-el-Hadd by the evening of that day. The upper winds from Karachi to Bombay had then come under its influence. It gave rise to locally heavy rainfall on the Mekran coast, both Ormara and Pasni receiving 3" in the 24 hours ending 8 hrs. of the 18th. The morning chart of the 18th indicated that the depression had intensified and lay with centre near Lat. 24°N. Long. 64°E.; Pasni reported rough sea with heavy swell and the pressure at the station was 0·2" below normal. The deep depression crossed the coast near Cutch Mandvi in the early morning of the 19th. On that morning Ormara and Karachi had 1·6" and 1·1" of rainfall respectively. It then moved rapidly north-eastwards and lay as a deep depression over the Punjab. During the night of the 18th-19th it caused widespread rain over north-west India and the central parts of the country; 2" to 4" of rain were recorded at several stations, Delhi recording 4·1" and Cherat 5·2" on the 20th. During the next 24 hours the depression weakened without appreciable change in position; but the rainfall associated with it continued to be widespread in the Punjab, the north-west Frontier Province, west Central India and the west Central Provinces, and also extended eastwards into the United Provinces and Bihar. Gohana (Rohtak district) recorded 3·4", Ambari (Dehra Dun district) 4·7" and Naiashahr (Saharanpur district) 5·1" on the 21st. Weakening further, the depression lay close to the east Punjab hills on the morning of the 21st and then passed away rapidly as a low pressure wave to north-east India by the morning of the 22nd, and finally disappeared during the day. The rainfall associated with it was widespread from the east United Provinces to Assam on the 21st.

2. **Depression in the Gulf of Mannar—Arabian Sea, 24th—28th April 1942.**—On the 8 hrs. chart of the 23rd, a shallow low pressure area was shown in the south-west Bay east of Ceylon. By the evening the 'low' was more marked and had moved over to the Gulf of Mannar, Negapatam reporting surface winds NE, force 5. By the next morning it had developed into a depression over the Gulf, with centre at 8 hrs. not far from Jaffna. The depression then moved west-north-westwards and weakened after crossing the coast during that night. The central region apparently passed through the Palghat gap during the 25th and lay in the Arabian Sea off the Malabar coast on the morning of the 26th. The low reintensified, and on the same evening lay as a depression with central region about 100 miles west of

Calicut. Continuing its west-north-westerly course the depression was centred on the 27th morning near Lat. 12°N., Long. 73°E. The depression subsequently moved in a north-north-westerly direction and could be located on the 28th morning about 150 miles west of Marmagao. Thereafter without further appreciable change in position it became unimportant on the 29th.

In association with this depression fairly widespread and locally heavy rain fell in south-east Madras, Malabar and Mysore on the 23rd and 24th; locally heavy rainfall occurred along and near the Malabar-south Konkan coasts on the next two days. The district averages were 2·8" in Tanjore on the 23rd, 2·1" in the Pudukottah State, Ramnad and Coimbatore on the 24th and 2·8" in Malabar on the 25th.

Some of the noteworthy amounts of rainfall caused by the depression are given below :—

April 23rd . . . .	Vedaranyam (Tanjore district) . . . . .	5·7"
	Hosdrug (South Kanara) . . . . .	10·9"
	Kasaragad (South Kanara) . . . . .	5·4"
April 24th . . . .	Viralimalai (Pudukottah State) . . . . .	5·8"
	Theethandathanam (Ramnad district) . . . . .	5·8"
	Thiruvadanai (Ramnad district) . . . . .	5·3"
	Manamadura (Ramnad district) . . . . .	5·0"
	Tiruppattur (Ramnad district) . . . . .	5·7"
	Irikkur (Malabar district) . . . . .	6·1"
April 25th . . . .	Tellicherry (Malabar district) . . . . .	7·1"
	Badagara (Malabar district) . . . . .	5·1"
	Kuttiyadi (Malabar district) . . . . .	9·5"
	Tirurangadi (Malabar district) . . . . .	10·1"

3. **Bay storm of 3rd to 5th June 1942.**—On the afternoon of the 2nd June two aeroplanes flying over the east Central Bay reported north-easterly and north-easterly winds indicating that weather was unsettled in the east Central Bay. The observations reported by the aircraft are given below :—

Date.	Position.		Hour of obsn. I.S.T.	Height of aircraft feet.	Wind.	Visiblity miles.	Cloud.	Sea.	Weather re-marks.
	Lat.	Long.			Knots.				
2nd June, 1942	16°17'	91°00'	1330	1500	50°/10	4	Cb 8/10 base 1500 ft. Top 4,000 ft.	Calm	Fair.
	16°50'	91°10'	1230	1500	70°/8	6	Ns, Fe, Cb 10/10, base 2,000, top 8/10,000. 5/10 As above 10,000.	Moderate	Fair.

Pressure continued to fall over the central Bay, and by 8 hrs. of the 3rd the unsettled conditions had concentrated into a depression with central region within 2 degrees of Lat. 16°N., Long. 91°E. During the course of the day, bad weather with heavy rainstorms was experienced by aircraft flying along and off the Arakan-Chittagong coast and rainfall had extended into south-east Bengal and Assam suggesting that the depression was intensifying further. By 8 hrs. of the 4th, the depression intensified into a cyclonic storm with its centre within 2 degrees of Lat. 18°N., Long. 90°E. It then took a northerly course and was centred at 1700 hrs. within a degree of Lat. 19½°N., Long. 90°E. Continuing to move in a northerly direction it weakened rapidly and filled up by the morning of the 5th.

Under its influence there was widespread rain with locally heavy falls in east Bengal on the 3rd and 4th and in Assam between the 4th and 11th.

4. **Bay storm of 8th to 13th July 1942.**—A low pressure wave from the east caused a fall of pressure over the head of the Bay of Bengal on the morning of the 7th. The fall continued during the next 24 hours and by 8 hrs. of the 8th, a depression had formed in the north of the Bay with its central region about 120 miles to the south-east of Calcutta. The depression remained practically stationary till 17 hrs. of that day but intensified during this interval. It then moved in a north-westerly direction and at 8 hrs. of the 9th it was a deep depression centred about 90 miles to the south-east of Calcutta.

It intensified further and became a cyclonic storm at 14 hrs. of the same day, with its centre about 50 miles to the east of Saugor Island, which reported north-north-westerly wind of force 9 B.F. Moving west-north-westwards the storm was centred midway between Calcutta and Saugor Island at 2 hrs. of the 10th. The lowest pressure recorded during this period at Saugor Island was 29.08" at 22 hrs. of the 9th, and that at Calcutta was 29.07" at 2 hrs. of the 10th, the pressure deficiencies being 0.44" and 0.41" respectively. The maximum wind velocity recorded at Calcutta was 50 m.p.h. at 4 hrs. 40 m. of the 10th. Continuing to move in a west-north-westerly direction, its centre was near Midnapore at 8 hrs. of the 10th, after which it weakened rapidly into a depression. The depression next moved in a nearly westerly direction and lay with its centre near Chaibasa at 17 hrs. of the same day and about 130 miles to the east of Pendra at 8 hrs. of the 11th. Altering its course towards the north-west, it was centred near Umaria at 8 hrs. of the 12th and between Guna and Nowgong at 8 hrs. of the 13th by which time it had weakened and had become a shallow depression. It continued to exist as such till the evening of the 17th, and later became unimportant.

In association with this storm, the monsoon strengthened in south Bengal, Orissa, Chota Nagpur and the Central Provinces, where locally heavy rainfall occurred during this period. Several districts in the Central Provinces recorded averages of 4" or more on the 12th while on the same date many individual stations recorded 8" or more. The following statements give details of the district averages and of particularly heavy rainfall that occurred at individual stations:—

*District averages.*

PROVINCE AND DISTRICT.	Amount.	Date.
<b>BENGAL—</b>		
Singbham . . . . .	4.5	9th.
<b>CENTRAL PROVINCES AND BERAR—</b>		
Drug . . . . .	4.7	12th.
Bhandara . . . . .	9.5	12th.
Balaghat . . . . .	6.3	12th.
Hoshangabad . . . . .	4.5 and 4.1	12th and 13th respectively.
Chhindwara . . . . .	6.6	12th.
Nagpur . . . . .	7.2	12th.

*Particularly Heavy Falls.*  
(10" and over).

STATION AND PROVINCE.	Amount.	Date.
Ramnagar (Bengal) . . . . .	11.0	9th.
Nayabasan (Bengal) . . . . .	13.3	10th.
Bodalkasa (C. P. & Berar) . . . . .	12.9	12th.
Gomdho (C. P. & Berar) . . . . .	12.1	12th.
Pachmarhi (C. P. & Berar) . . . . .	10.6	12th.
Tamia (C. P. & Berar) . . . . .	15.5	12th.
Ramtek (C. P. & Berar) . . . . .	11.1	12th.
Khindsi (C. P. & Berar) . . . . .	11.0	12th.
Parseoni (C. P. & Berar) . . . . .	12.5	12th.

5. **Shallow land depression of 17th to 19th July 1942.**—The isobaric chart on the morning of the 17th showed a shallow low pressure area over Jhota Nagpur and south-west Bengal. It moved west-north-westwards and lay over Chota Nagpur on the morning of the 18th and became unimportant during the next 24 hours.

Under its influence widespread rain with locally heavy falls occurred in the central parts of the country and in the United Provinces. Some of the noteworthy district averages as well as heavy falls are given below:—

*District averages.*—Hoshangabad 2.4" on 17th; Allahabad 2.2" on 19th.

*Noteworthy heavy falls.*—Lanji (Balaghat) 10.9" on 17th; Karchan (Allahabad) 5.3" on 19th.

6. **Bay depression of 23rd to 29th July 1942.**—The isobaric and upper air charts on the morning of the 23rd showed that weather was markedly unsettled in the north-west Bay. During the next 24 hours there was a marked fall of pressure over north-east India and a depression formed at the head of the Bay with central region about 80 miles south-east of Calcutta. The depression moved north-westwards and was centred about 50 miles south-east of Calcutta at 17 hrs. of the 24th. Continuing to move in the same direction, the depression passed inland by 2 hrs. of the 25th and was centred near Calcutta at 9 hrs. of that day. Thereafter the depression took a west-north-westerly course and lay over Chota Nagpur with centre about 50 miles to the west of Ranchi on the 26th morning, and over Central India to the west of Sutna on the morning of the 27th. It then weakened and moved to the neighbourhood of Jhansi by the morning of the 28th and disappeared during the next 48 hours.

Associated with westward movement of this depression, widespread and locally heavy rain fell along and near its track, especially in the central parts of the country, and there was a general strengthening of the monsoon outside parts of north-west India. Some of the noteworthy falls and district averages of rainfall are given in the table below:—

*District averages.*

PROVINCE AND DISTRICT.	Amount.	Date.
<b>C. P. AND BERAR—</b>		
Saugor . . . . .	2.2 and 5.0	26th and 27th, respectively.
Jubbulpore . . . . .	3.0 and 2.1	Ditto.
Mandla . . . . .	2.0	27th.
Bhandara . . . . .	3.0	26th.
Hoshangabad . . . . .	3.7	27th.
<b>UNITED PROVINCES—</b>		
Jhansi . . . . .	2.8	27th.
<b>GWALIOR STATE—</b>		
Guna . . . . .	4.5	26th, 27th and 28th.
Bhilsa . . . . .	6.5	26th.
<b>INDORE STATE—</b>		
Rampura . . . . .	3.4	28th.
<b>BHOPAL STATE—</b>		
Eastern district . . . . .	4.5	27th.
Western district . . . . .	3.2	27th.
<b>BHOPAL AGENCY—</b>		
Narsingarh . . . . .	3.1 and 3.0	27th and 28th, respectively.
Rajgarh . . . . .	3.1 and 4.0	Ditto.
Kurwai . . . . .	5.8	26th.
Khilchipur . . . . .	3.4 and 2.0	27th and 28th, respectively.
Pathari State . . . . .	7.7 and 1.8	26th and 27th, respectively.

*Particularly Heavy Falls. (7" and above).*

STATION AND DISTRICT.	Amount.	Date.
Bhograi (Balasore) . . . . .	7.4	24th.
Saugor Observatory (Saugor) . . . . .	9.8	27th.
Rehli (Saugor) . . . . .	8.8	27th.
Deori (Saugor) . . . . .	7.5	27th.
Jubbulpore Observatory (Jubbulpore) . . . . .	8.8	27th.
Tendukhera (Hoshangabad) . . . . .	9.0	27th.
Chachaura (Guna) . . . . .	7.1	28th.
Basoda (Bhilsa) . . . . .	7.6	26th.
Begumganj Sowas (Bhopal) . . . . .	8.0	27th.
Salwani (Bhopal) . . . . .	7.8	27th.
Pathari (Pathari State) . . . . .	7.7	26th.

7. **Bay depression of 27th to 31st July 1942.**—Unsettled conditions appeared at the head Bay on the morning of the 27th. They persisted during the day and developed into a depression by 8 hrs. of the 28th with central region about 100 miles southeast of Calcutta. Moving west-north-westwards the depression crossed the coast in the early hours of the 29th, and lay over south-west Bengal with central region near Midnapore at 8 hrs. of that day. Following nearly the same course and moving rapidly, the depression was centred near Umaria on the morning of the 30th and near Jhansi at 8 hrs. of the next day. It became unimportant during the next 24 hours.

Widespread and locally heavy rain fell in the central parts of the country during its passage, the falls being specially heavy on the 29th in the west Central Provinces and west Central India, where many districts had average falls of 2 to 3 inches. The specially noteworthy falls were:—Chorkhamara (Bhandara district) 6.2" on 30th; Dongargaon (Balaghat district) 7.6" on 30th; Saletaka (Balaghat district) 6.6" on 30th.

8. **Deep Bay depression of 31st July to 6th August 1942.**—The formation of a "low" at the head of the Bay was noticed on the surface chart on the morning of the 31st July. This was supported by the upper winds over Calcutta, up to 2 kms.; these had weakened and backed to NE/N from the southerly directions which had obtained the previous day. By 8 hrs. next morning a depression had formed there with centre near Lat. 22°N., Long. 90°E. The depression moved in a westerly direction deepening at the same time, and at 8 hrs. of the 2nd August it was centred about 80 miles south-south-west of Calcutta. Continuing to move in the same direction, the deep depression was centred at 17 hrs. of the same day close to the coast about 20 miles to the south-south-east of Balasore, when it had a barometric depth of 0.35 inch. It crossed the coast between Balasore and Chandbali by 22 hrs. of the 2nd, and lay centred near Sambalpur at 8 hrs. of the next day. Thereafter the depression, which was still deep, moved quickly in a west-north-westerly direction and was centred about 70 miles

north-north-west of Raipur at 17 hrs., that day, near Pachmarhi on the morning of the 4th, and near Mount Abu on the morning of the 5th. It then weakened and lay over lower Sind at 8 hrs. of the 6th and merged into the seasonal low by the next morning.

During the westward passage of the depression there was widespread and locally heavy rain along its track, especially to its south, in Orissa, the central parts of the country and Gujarat, and the adjacent districts of Hyderabad and the Bombay Deccan, where several districts had an average fall of 2" and above. The average district falls exceeding 4" are given below.

*District averages.*

PROVINCE AND DISTRICT.	Amount.	Date.
<b>CENTRAL PROVINCES AND BEHAR—</b>		
Bhandara . . . . .	7.0	4th.
Nimar . . . . .	4.2	4th.
Betul . . . . .	4.0	4th.
Wardha . . . . .	5.0	4th.
Amraoti . . . . .	4.2	4th.
<b>BOMBAY—</b>		
Kaira . . . . .	5.8	5th.
Broach and Panch Mahals . . . . .	7.6	5th.
Surat . . . . .	4.1	5th.

*Particularly Heavy Falls (7" and over).*

STATION AND DISTRICT.	Amount.	Date.
Balandapara (Ganjam) . . . . .	10.0	3rd.
Gariabund (Raipur) . . . . .	11.9	3rd.
Gattasilli (Raipur) . . . . .	8.6	3rd.
Deobhog (Raipur) . . . . .	7.2	3rd.
Bodalkasa (Bhandara) . . . . .	11.4	4th.
Khyrbund (Bhandara) . . . . .	9.1	4th.
Tirora (Bhandara) . . . . .	8.7	4th.
Pamgru (Bhandara) . . . . .	8.7	4th.
Gomdho (Bhandara) . . . . .	8.1	4th.
Bhainsdehi (Betul) . . . . .	7.1	4th.
Chikalda (Amraoti) . . . . .	9.3	4th.
Dakar (Kaira) . . . . .	8.4	5th.
Broach (Broach) . . . . .	7.1	5th.
Surat (Surat) . . . . .	7.3	5th.
Vagra (Broach and Panch Mahals) . . . . .	9.8	5th.
Kalol (Broach and Panch Mahals) . . . . .	8.4	5th.
Halol (Broach and Panch Mahals) . . . . .	13.8	5th.

**9. Bay depression of 30th August to 8th September 1942.**—In connection with revival in the activity of the Bay monsoon a shallow low pressure area formed off the north Madras-Orissa coast on the 25th. It was nearly stationary for the next two days, causing rainfall in the neighbouring coastal regions. Due to the passage of a low pressure wave from the east, the low pressure area became elongated from the Orissa coast to the north-east of the Bay by the evening of the 27th. A depression appears to have formed during the next day; on the morning of the 29th its central region was near Lat.  $18\frac{1}{2}^{\circ}$ N., Long.  $90^{\circ}$ E. and on the morning of the 30th, it was near Lat.  $19\frac{1}{2}^{\circ}$ N., Long.  $88\frac{1}{2}^{\circ}$ E. The upper wind charts showed a feeble cyclonic circulation at the head of the Bay up to 3 kms. The depression moved in a northwesterly direction and crossed the Orissa coast during the night of the 30th and was centred on the morning of the 31st, about 50 miles north of Cuttack. It then moved in a west-north-westerly direction and was situated over the east Central Provinces with centre between Pendra and Raipur on the morning of the 1st September. The centre lay near Saugor on the morning of the 2nd and near Guna on that of the 3rd. During these days the rainfall associated with the depression was widespread and locally heavy in the central parts of the country and the north of the Peninsula. Fairly widespread rainfall also occurred in south Bengal, Orissa and Chota Nagpur. The depression took a more north-westerly course thereafter and was near Jaipur at 8 hrs. of the 4th, and east of Bikaner on the 5th. As usual the Arabian Sea monsoon strengthened and its activity stimulated over northwest India, giving widespread rain to the south of the depression Rajputana, Gujarat and west Central India, while the Bay current was also drawn up the Gangetic plain with widespread rainfall over the United Provinces and some heavy falls near the centre. The depression then weakened and moving northwards was centred between Briganagar and Bikaner on the morning of the 6th. It then recurved eastwards the centre being near Hissar on the 7th and between Delhi and Dehra Dun on the 8th. It finally broke up on the Simla-Kumaon hills during the 8th.

Widespread rainfall occurred in the Punjab and north Rajputana on the 5th; between the 6th and 9th it occurred mostly to the east and north of

the depression. Some of the noteworthy district averages and the noteworthy amounts of rainfall (7" and above) during its life are given below.

*District averages.*

PROVINCE AND DISTRICT.	Amount.	Date.
Pabna (Bengal) . . . . .	3.1	5th.
Agra (U. P.) . . . . .	4.4	4th.
Allahabad (U. P.) . . . . .	3.1	5th.
Morena (C. I.) . . . . .	4.7	3rd.
Patiala State (Punjab) . . . . .	3.6	7th.
Nizamatsadar (Rajputana) . . . . .	4.0	6th.
Nizamatsujargarh (Rajputana) . . . . .	4.1	6th.
Alwar State (Rajputana) . . . . .	5.0	5th.
Bharatpur State (Rajputana) . . . . .	6.4	4th.

*Particularly Heavy Falls.*

STATION AND PROVINCE.	Amount.	Date.
Pabna (Bengal) . . . . .	8.2	5th.
Bassawan (Bihar) . . . . .	9.9	5th.
Hazaribagh (Chota Nagpur) . . . . .	9.7	5th.
Khairagarh (U. P.) . . . . .	7.8	4th.
Maganwara (U. P.) . . . . .	8.0	3rd.
Morena (C. I.) . . . . .	8.6	3rd.
Kaman (Rajputana) . . . . .	9.2	4th.

**10. Bay depression of 9th-12th September 1942.**—A fall of barometric pressure was noticed over northeast India on the morning of the 7th, which continued and extended over the country during the next 48 hours. On the morning of the 9th a low pressure area appeared over land in Bengal and in addition to it a low pressure area was developing in the northeast angle of the Bay. The upper air circulation showed that a depression had formed with centre close to the Chittagong coast. On the morning of the 10th the centre was very near Lat.  $21^{\circ}$ N., Long.  $90^{\circ}$ E. The depression travelled almost due west and on the morning of the 11th was centred near Lat.  $21^{\circ}$ N., Long.  $88^{\circ}$ E. It remained practically stationary till the evening of the 11th, and then crossed the coast between Balasore and Chandbali. Next morning it was shown as a diffuse depression over Orissa and the neighbouring districts of the Central Provinces. It caused very heavy rain to its west, the district averages in the 24 hours ending 8 A.M. of the 12th being 5" or a little more in the districts of Drug and Raipur. At individual stations in these districts very heavy rain fell: in Drug district Kharra recorded 11.8" while in Raipur district Pimdron recorded 12.8", Kusragi 13.2", Kumbhari 8.4" and Kanki 12.7".

The depression continued to move westwards and lay with central region in the neighbourhood of Nagpur on the morning of the 13th and caused fairly widespread rain in the west Central Provinces. It became unimportant in the next 24 hours.

**11. Land depression of 19th-23rd September 1942.**—On the morning of the 16th a general fall of pressure was noticed over north-east India and north and central Bay, while stations over north and east Bengal and Assam showed a marked pressure deficiency. The fall of pressure continued over north Bay during the next 48 hours, and on the morning of the 18th a trough of low pressure appeared at the head of the Bay indicating that conditions were unsettled there. By the morning of the 19th a shallow depression had formed over south Bengal with its centre at 8 hrs. near Jessore. It first moved west-north-westwards and was centred near Bankura on the 20th morning. Thereafter it turned north-eastwards and was centred near Dinajpur on the 21st. Continuing to move in the same direction towards Assam it became unimportant by the 23rd.

Under the influence of this disturbance the monsoon strengthened in Assam and Bengal where widespread and locally heavy rainfall occurred. Some of the noteworthy amounts and district averages of rainfall 2" and over are given below:—

*District averages.*

PROVINCE AND DISTRICT.	19th.	20th.	21st.	22nd.	23rd.
<b>BENGAL—</b>					
Boalia . . . . .	3.1	4.1	..	..	..
Dinajpur . . . . .	..	3.2	4.7	..	..
Rangpur . . . . .	..	..	5.3	4.3	..
Bogra . . . . .	..	5.6	3.5	..	..
Pabna . . . . .	..	3.6	2.0	..	..
Malda . . . . .	..	4.2	2.8	..	..
Mymensingh . . . . .	..	2.3	2.0	4.1	..
Chittagong . . . . .	..	2.4	3.9	2.7	..
Noakhali . . . . .	3.6	2.5	4.2	2.9	..

*District averages—contd.*

PROVINCE AND DISTRICT.	19th.	20th.	21st.	22nd.	23rd.
<b>EASTERN STATES—</b>					
Cooch Behar . . . . .	..	..	3.1	3.2	..
<b>ASSAM—</b>					
Goalpara . . . . .	..	2.1	5.3	4.0	..
Garo Hills . . . . .	..	..	5.6	10.9	6.3
Khasi and Jaintia Hills . . . . .	..	5.0	6.7	8.5	4.1

*Particularly Heavy Falls.*

PROVINCE AND DISTRICT.	STATION.	19th.	20th.	21st.	22nd.	23rd.
<b>BENGAL—</b>						
Boalia . . . . .	Chaugram . . . . .	8.2	..	..	..	..
Dinajpur . . . . .	Itahar . . . . .	..	..	13.5	..	..
Do. . . . .	Dinajpur . . . . .	..	..	9.3	..	..
Do. . . . .	Balurghat . . . . .	..	..	10.5	..	..
Rangpur . . . . .	Kurigaon . . . . .	..	8.2	..	..	..
Do. . . . .	Rangpur . . . . .	..	..	8.7	8.2	..
Do. . . . .	Saidpur . . . . .	..	..	11.6	..	..
Bogra . . . . .	Panchbibi . . . . .	..	7.5	..	..	..
Do. . . . .	Dubchanchia . . . . .	..	..	8.0	..	..
Kawardha . . . . .	Kawardha . . . . .	..	9.2	..	..	..
<b>ASSAM—</b>						
Goalpara . . . . .	Mankachar . . . . .	..	7.3	10.2	..	..
Khasi and Jaintia Hills . . . . .	Mawsynram . . . . .	..	18.2	23.6	..	..
Do. . . . .	Cherrapunji (Welsh Mission House). . . . .	..	..	8.8	24.9	7.7
Do. . . . .	Mawphlang . . . . .	..	..	..	10.4	..
Do. . . . .	Jowai . . . . .	..	..	..	..	10.1

**12. Bay depression of 26th-30th September 1942.**—On the evening of the 25th a fall of pressure was noticed along and off the Orissa-Madras coasts, and widespread thundershowers were reported from stations in coastal Bengal and Orissa. These indicated that conditions were unsettled in the central Bay. By the morning of the 26th, rainfall extended along the Circars-Coromandel coast and a depression formed in the west central Bay with its centre at 8 hrs. about 200 miles east of Vizagapatam. The depression first took a northerly course and was centred near Lat.  $18\frac{1}{2}^{\circ}$ N., Long.  $86\frac{1}{2}^{\circ}$ E. at 18 hrs. of 26th. Thereafter moving initially in a northerly and later in a north-westerly direction it crossed coast near Puri on the morning of the 27th. Mohana (Ganjam district) recorded 8.1" on the 27th. Continuing to move north-westwards it was centred near Sambalpur on the morning of the 28th. It again took a northerly course and was centred on the morning of the 29th near Patna. When the depression was over Bihar, it caused widespread and locally very heavy rain there with the result that several districts registered an average rainfall of 2 to 4 inches on the morning of the 29th. It filled up during the course of the next 24 hours.

Some of the noteworthy amounts of rainfall are :—

PROVINCE AND DISTRICT.	STATION.	28th.	29th.	30th.
<b>BIHAR—</b>				
Patna . . . . .	Naubatpur . . . . .	10.2	..	..
Do. . . . .	Patna . . . . .	..	8.6	..
Do. . . . .	Dinapore . . . . .	..	9.2	..
Do. . . . .	Bikram . . . . .	..	10.0	..
Do. . . . .	Palliganj . . . . .	..	11.0	..
Do. . . . .	Badalpura (Khagole) . . . . .	..	8.5	..
Gaya . . . . .	Aurangabad . . . . .	..	9.3	..
Do. . . . .	Jahanabad . . . . .	..	10.4	..
Saran . . . . .	Parsa . . . . .	..	10.5	..
Muzaffarpur . . . . .	Muzaffarpur . . . . .	..	8.0	..
Do. . . . .	Sheohar . . . . .	..	7.7	..
Darbhanga . . . . .	Darbhanga . . . . .	..	9.1	..
Do. . . . .	Madhubani . . . . .	..	..	15.7
Do. . . . .	Khajantli . . . . .	..	..	15.7
Do. . . . .	Benipatti . . . . .	..	..	8.5
Do. . . . .	Ungaon . . . . .	..	..	17.4

**13. Depression in the Arabian Sea of 11th to 13th October 1942.**—On the morning of the 7th widespread but generally light rain was reported from stations along the Orissa-Madras coast. There was a fall of pressure along the Madras coast and a cyclonic circulation of the upper winds up to 1.5 kms. at Vizagapatam, Masulipatam, Madras and Trichinopoly. This indicated a tendency for the formation of a depression in the west central Bay. These indications were less marked next morning when only an extended low pressure area was shown off the Coromandel coast. The low pressure had extended inland in the next twenty-four hours and widespread and locally heavy rain had fallen on the Coromandel coast and the neighbouring

inland districts in these two days. By the morning of the 10th the low pressure area was passing out into the Arabian Sea where conditions became unsettled; the partition between the monsoon current in the extreme south of the Peninsula and the dry current to the north became more marked than usual on this day. In the previous 24 hours there had again been widespread rain over the south of the Peninsula with an extension northwards to the Bombay Deccan. By the morning of the 11th the unsettled condition in the Arabian Sea had given rise to a shallow depression with central region near Lat.  $13^{\circ}$ N., Long.  $72^{\circ}$ E. The depression remained practically stationary during the next two days, and weakened into a trough of low pressure by the evening of the 13th. During its existence it caused fairly widespread and locally heavy rain in the western half of the Peninsula, the falls being particularly heavy in Malabar on the 12th and 13th.

**14. Severe Bay storm of 14th to 18th October 1942.**—The surface and upper wind charts on the morning of the 11th showed that weather was unsettled in the southwest Bay. On the night of the 11th a severe typhoon was reported to have sunk the French 1900-ton steamer "Laos" off the coast of Indo-China. This typhoon apparently moved west-north-westwards and crossed over into the central Bay of Bengal where conditions became markedly unsettled on the morning of the 12th. Pressure continued to fall over the north and central Bay during the next 48 hours and by the morning of the 14th a depression formed in the Bay with its centre within two degrees of Lat.  $17^{\circ}$ N., Long.  $90^{\circ}$ E. Heavy showers were reported by aircraft flying off the Arakan-Chittagong coast on the morning of the 14th and by midday, rain had commenced along the Chittagong coast. Moving in a north-north-westerly direction the depression intensified into a cyclonic storm by the morning of the 15th when it was centred within a degree of Lat.  $18\frac{1}{2}^{\circ}$ N., Long.  $88\frac{1}{2}^{\circ}$ E. It then took a northerly course and was centred about 80 miles southeast of Chandbali on the evening of the 15th. Continuing to intensify during the course of the day, it had become a severe cyclonic storm by 3 hrs. of the 16th with its centre about 150 miles south-south-west of Calcutta. The surface wind at Sandheads attained a force of 7 B.S. at 22 hrs. of the 15th and increased to 9 B.S. at 2 hrs. of the 16th. Following a northerly track the severe cyclone was located at 8 hrs. of the 16th about 90 miles to the south-south-west of Calcutta. The barometric pressure at 8 hrs. of that date was 0.40", 0.48" and 0.57" below normal at Chandbali, Saugor Island and Sandheads respectively. The surface wind at Sandheads attained hurricane force (12 B.S.) at 11hrs. and remained so till 13 hrs. indicating that the central region of the severe storm was very close to the station. The observations recorded at Sandheads and Saugor Island (given in the Table below) will give an idea of the depth and severity of the storm.

**SANDHEADS.**

Date.	Hr. of Obsn. I.S.T.	Pressure.	Pressure departure.	WIND.		Sea.	Swell.	REMARKS.
				Dir.	Force (B. S.).			
15th October.	0200	29.62	—17	NNE	5	..	..	Th. storm with rain.
	0600	29.64	—18	NNE	5	..	..	Ditto.
	0837	29.60	—18	NNE	5	Rough	..	Int. sl. rain.
	0800 L.T.							
	1200	29.62	—19	NE	5	Mod.	..	Int. mod. rain.
	1500	29.57	—18	ENE	6	Rough	Mod. av. length.	Cont. mod. rain.
	1800	29.59	—17	ENE	5	Mod.	..	Cont. mod. drizzle.
	1900	29.59	—20	E	6	..	..	Ditto.
	2000	29.58	—24	ENE	6	..	..	Overcast.
	2100	29.56	—27	NE	5	..	..	Ditto.
16th October.	2200	29.55	—28	ENE	7	..	..	Ditto.
	2300	29.54	—28	E	7	..	..	Ditto.
	2400	29.53	—28	ENE	7	Rough	..	Int. sl. drizzle.
	0100	29.51	—31	ENE	6	..	..	Rain shower in last hour.
	0200	29.49	—33	ESE	9	..	..	Heavy rain shower.
	0300	29.46	—35	ENE	8	..	Mod. long.	Ditto.
	0400	29.44	—37	ENE	7	..	..	Ditto.
	0500	29.42	—41	ENE	7	..	..	Cont. thick drizzle.
	0600	29.39	—45	ENE	8	..	Mod. long.	Cont. thick rain.
	0700	29.36	—51	ENE	9	V. Rough.	..	Drizzle.
	0800	29.29	—60	ENE	9	..	Heavy short.	Ditto.
	0837	29.31	—57	ENE	9	..	..	Rain.
	0900	29.20	—69	E	11	..	..	Cont. sl. rain.

SANDHEADS—contd.

Date.	Hr. of Obsn. I.S.T.	Pressure.	Pressure departure.	WIND.		Sea.	Swell.	REMARKS.
				Dir.	Force (B. S.).			
	1000	29-05	—84	E	11	"	"	Cont. mod. rain.
	1100	28-79	—1-07	ESE	12	"	"	Cont. heavy rain.
	1200	28-04	—1-20	ESE	12	High	"	Ditto.
	1300	28-61	—1-20	SE	12	"	"	Ditto.
	1400	28-67	—1-12	SSE	11	"	"	Ditto.
	1500	28-86	—92	S	11	"	"	Ditto.
	1600	28-88	—90	S	11	"	"	Ditto.
	1700	29-11	—68	SSW	11	"	"	Ditto.
	1800	29-19	—62	SSW	11	"	"	Cont. rain and squall.
17th October.	0100	29-54	—29	SSW	8	Rough	Mod. av. length.	Cont. mod. rain.
	0130	Barometer broken.						

SAUGOR ISLAND.

Date.	Hr. of Obsn. I.S.T.	Pressure.	Pressure departure.	Av. speed m.p.h.	Wind.		Sea.	Swell.	REMARKS.
					Dir.	Force (B. S.).			
16th October.	0100	29-54	—28	18	NE	5	..	..	Overcast.
	0200	29-52	—28	19	NE	4	..	..	Int. sl. rain.
	0300	29-49	—31	21	NE	5	..	..	Cont. sl. rain.
	0400	29-47	—34	29	ENE	6	..	..	Th. storm.
	0500	29-46	—35	27	ENE	6	..	..	Cont. mod. rain.
	0600	29-43	—40	31	ENE	8	..	..	Cont. sl. rain.
	0700	29-45	—43	33	NE	33	Mod.	Mod. av. length.	Squally weather.
	0800	29-41	—46	37	E	9	..	..	Int. heavy rain.
	0838 (0800 L. T.).	29-38	—48	20	E	9	..	..	Cont. sl. drizzle.
	0900	29-37	—51	25	E	10	..	..	Ditto.
	1000	29-32	—55	23	E	10	High	Heavy av. length.	Ditto.
	1100	29-21	—65	..	E	..	..	..	Cont. heavy rain.
	1200	29-09	—74	..	E	..	..	..	Ditto.
	1300	29-03	—77	..	E	..	..	..	Ditto.
	1800	Observations not recorded.							
17th October.	0600	29-58	—25	..	WSW	5	..	..	Cloudy.
	0838	29-66	—20	..	WSW	5	Slight	Mod. short.	Ditto.

By the evening of the 16th the severe cyclone struck the southwest Bengal coast between Saugor Island and Balasore (about 55 miles southeast of Midnapore). It then curved north-north-eastwards slowly diminishing in intensity and was centred as a storm on the 17th morning near Krishnagar where the pressure at 8 hrs. was 0.46" below normal. Thereafter moving in the same direction the storm weakened rapidly and was centred as a depression on the 18th morning near Rajshahi. It rapidly filled up over north Bengal during the course of the day.

Calcutta although not actually traversed by the centre of the storm, still experienced gales throughout the night of the 16th. The maximum force was felt between midnight and 1 A.M. when a gust of 68 m.p.h. was recorded. With the northward movement of the storm, the wind at Calcutta gradually veered from E on the 16th evening to SW on the morning of the 17th. The following special Storm Report from the observer at Saugor Island is interesting.

"A cyclonic storm of great intensity passed over Saugor Island light-house on the 15th and 16th October 1942, commencing at 20 hrs. of the 15th and reaching a peak between 0800 and 1800 hrs. of the 16th when a speed of wind between 80 miles to 100 miles was reached on the anemograph. The storm subsided about 0400 hrs. of the 17th."

The following extract from the report of the Senior Officer on duty on board the Pilot Vessel "Lady Fraser" anchored in the Beaumonts Gut Channel Lat. 21°33'N., Long. 87°57½'E. on the 16th October 1942 gives a very vivid picture of the severity of the storm:—

"At daylight on Wednesday 14th the first sign of storm cloud to the South and the wind which had been NE—ly on the 12th, 13th and 14th increased from light airs to force 3 on the evening of the 14th and the storm cloud to the south had by sunset increased to a solid blackwall towering the entire southern horizon from east to west. Also on the same evening there were occasional light squalls in which the wind veered from NNE to NE and ENE. On Thursday morning the 15th it was apparent that storm was approaching and travelling in a NNW direction. The squalls increased in frequency and intensity and the mercury in the Barometer continued to fall slowly, until about 2 A.M., on Friday morning when the Barometer reading was 29.38 wind E/S force 6, with frequent heavy squalls.

From 2 A.M., Friday 16th to 2 P.M. on the same day the mercury fell from 29.38 to 28.72 which was the lowest reading recorded and the wind during this time veered gradually from ENE to SSE with a force varying from 8 to 12.

At about 2 P.M., it then being about high water, it was estimated that the centre of the storm was bearing about west 10 to 15 miles and the velocity of the wind at 140 miles per hour. The anemometer which had been destroyed before the storm had reached its height registered 120 m.p.h. During this time owing to the heavy rain and the sand laden spray, visibility was only a few yards and pieces of wood which were thrown over the side to see if the vessel was dragging almost disappeared from view before they reached the water.

Frequent soundings were taken and sometime in the afternoon increased from about 7½ fathoms to 10½ and was without doubt due to tidal wave following in the wake of the storm.

After the storm centre had passed the wind veered about one point per hour up to 8 P.M., and between 2 P.M., and 8 P.M., the mercury had risen from 28.72 to 29.26. After this the weather improved rapidly."

Observations on board some of the steamers which were in the storm field and were consequently experiencing winds of gale force and more are given in the following tables:—

(a) "Lady Fraser" Position: Lat. 21°33'N., Long. 87°57½'E.

Time (Bengal Time).	Barometer.	WIND.		REMARKS.
		Dir.	Force (B.S.).	

Date: Friday, the 16th October 1942.

0200	29-38	E/S	6	Squally.
0400	29-36	ENE	8	Ditto.
0600	29-32	ENE	8-9	Squally, raining, O'cast.
0800	29-26	ENE	8-9	Ditto.
1000	29-09	E	10-11	Cyclone.
1200	28-78	ESE	12	Ditto.
1400	28-72	SSE	11	Ditto.
1600	29-02	S	11	Ditto.
1800	29-16	SW/S	11	Ditto.
2000	29-26	SW	9	Ditto.
2200	29-33	SSW	8	Ditto.
2400	29-33	SSW	6	Squally.

Saturday, the 17th October 1942.

0200	29-33	SW	7	Squally.
0400	29-34	SW/W	6	Ditto.
0600	29-45	WSW	6	Ditto.

(b) D. V. "Dumayne" at anchor at Kulpi and Diamond Harbour.

Time (Bengal Time).	WIND.		Barometer.	Sea.	REMARKS.
	Dir.	Force (B.S.).			

Date: Friday, 16th October 1942.

0637	NE	6/7	29-60	2	O'cast, raining, squally.
0737	E	6/7	29-61	2	O'cast, gusty, shower.
0837	E	7	29-61	3	O'cast, shower, squally.
0937	NE	6	29-62	3	Ditto.
1037	ENE	6/8	29-61	3	Ditto.
1137	E	8	29-57	3	Ditto.
1237	E	8	29-55	3	Ditto.
1337	E	7/8	29-51	3	Ditto.
1437	ESE	9	29-47	4	O'cast, raining, squally.
1537	SE/E	9	29-45	5	Ditto.

(b) D. V. "Dumayne" at anchor at Kulpi and Diamond Harbour—contd.

Time (Bengal Time).	WIND.		Barometer.	Sea.	REMARKS.
	Dir.	Force (B.S.).			
Date : Friday 6th October 1942—contd.					
1637	SE	9/10	29-43	5	O'cast, raining, squally.
1737	SE	10	29-42	6	Ditto.
1837	SE	10	29-40	6	Ditto.
1937	SE/E	11/12	29-38	6	Ditto.
2037	SE/E	11/12	29-38	6	Ditto.
2137	SSE	12	29-41	6/7	Ditto.
2237	SE/E	11/12	29-42	6/7	Ditto.
2337	SE/S	11/12	29-43	6/7	Ditto.
Saturday, 17th October 1942.					
0037	S	11/12	29-46	6/7	O'cast, raining, squally lightning.
0137	S/W	11	29-47	6	O'cast, shower, squally.
0237	S/W	10	29-50	5/6	Ditto.
0337	S/W	9	29-51	5	Ditto and lightning.
0437	S/W	9/10	29-52	4/5	O'cast, squally, lightning.
0537	SSW	8	29-57	4	Ditto.
0637	SSW	6/7	29-61	2	Cloudy.

(c) Weather experienced by Dredger "Gunga" Eastern Gut Bar.

Friday, the 16th October 1942.

" 1200 hrs.—Bar. 29-64, wind East, force 7, with heavy squalls of wind and rain.

1400 hrs.—Bar. 29-50, wind East, force 7/8, squally of wind and rain.

1530 hrs.—A very strong flood tide was observed.

1600 hrs.—Bar. 29-50, wind East, force 7/8, heavy rain squalls.

1800 hrs.—Bar. 29-46, wind East, force 7/8.

2000 hrs.—Bar. 29-42 wind East, force 7/8, fierce squalls of wind and rain.

2200 hrs.—Bar. 29-38, wind SE, force 8, fierce squalls.

2400 hrs.—Bar. 29-34, wind SE, force 8/9, slight lulls followed by terrific squalls. Believe centre of storm passing very close to position of vessel.

Saturday, the 17th October 1942.

0110 hrs.—Wind S.

0200 hrs.—Bar. 29-40, wind S. force 8.

0300 hrs.—Bar. 29-45, wind SW, force 7, weather improving.

0400 hrs.—Bar. 29-47, wind SW, force 7, weather improving.

0600 hrs.—Bar. 29-60, wind SW, force 6, weather improving."

The storm was responsible for heavy loss of life and devastation in the districts of Midnapore and 24 Parganas. There was also some loss of human life and live-stock and damage to house property in the areas of Jalesore, Bhograi, Baliapal and Singla in the northern part of the Balasore district. Associated with the storm, widespread and locally heavy rain fell in south-west Bengal. Some of the district averages of rainfall and particularly heavy falls associated with the storm are given in the Tables below :—

District averages.

PROVINCE AND DISTRICT.	Amount.	Date.
BENGAL—		
24 Parganas . . . . .	1-7 & 3-0	16th and 17th respectively.
Nadla . . . . .	2-2 & 2-5	Ditto.
Murshidabad . . . . .	1-7 & 4-3	Ditto.
Burdwan . . . . .	4-5	17th.
Birbhum . . . . .	2-4 & 2-6	16th and 17th respectively.
Bankura . . . . .	2-7	17th.
Midnapore . . . . .	3-0 & 2-5	16th and 17th respectively.
Hooghly . . . . .	3-3 & 2-4	Ditto.

Particularly heavy falls.

STATION AND DISTRICT.	Amount.	Date.
Dumkal (Murshidabad) . . . . .	7-7	17th.
Lalgola (Murshidabad) . . . . .	8-1	18th.
Burdwan (Burdwan) . . . . .	7-1	17th.
Katwa (Burdwan) . . . . .	7-4	17th.
Mangalkot (Burdwan) . . . . .	7-0	17th.
Jindas (Bankura) . . . . .	7-1	16th.
Sitmanipur (Bankura) . . . . .	7-7	16th.

Particularly heavy falls—contd.

STATION AND DISTRICT.	Amount.	Date.
Patrasayer (Bankura) . . . . .	7-9	17th.
Tamluk (Midnapore) . . . . .	7-4	16th.
Dantan (Midnapore) . . . . .	12-7	16th.
Kharagpur (Midnapore) . . . . .	11-5	16th.
Contai (Midnapore) . . . . .	8-1	17th.
Midnapore (Midnapore) . . . . .	12-8	17th.
Balichak (Midnapore) . . . . .	8-5	17th.
Tarakeswar (Hooghly) . . . . .	7-5	16th.
Chanditola (Hooghly) . . . . .	7-3	17th.
Ulubaria (Howrah) . . . . .	7-3	17th.
Balughat (Dinajpur) . . . . .	8-2	18th.
Jallesore (Balasore) . . . . .	14-5	17th.

A brief history of the storm just before and after it struck the Bengal coast is given in the following extract from the speech of the Revenue Minister of Bengal made before the Bengal Legislative Council :—

" A heavy cyclone from the Bay passed over several districts of Bengal on October 16. It began about 7 or 8 o'clock in the morning and spent itself in the early hours of the next morning. In the afternoon of October 16, there was a high tidal bore forced up by the cyclone from the Bay which broke into the mainland and devastated a considerable area in the southern part of Midnapore and the 24-Parganas districts. The cyclone was accompanied by heavy rain at certain places; it was as heavy as 12" in less than 24 hours. All the rivers in these districts were in heavy flood due to the tidal bore, rain and force of wind. In the worst affected areas there was a heavy loss of human lives—the present estimate being not less than 10,000 persons in the Midnapore district and 1,000 in the 24 Parganas district.

The loss of cattle was even heavier—nearly 75 per cent. As to houses, practically every kutcha house was severely damaged or destroyed and only pucca houses except those with corrugated iron roof remained standing."

The tidal bore forced up by the cyclone devastated an area of about 250 square miles in the southern part of Midnapore and 24 Parganas district. The maximum depth of water in the submerged area was as much as 16 ft. at some places. The following extract from the report of the special representative of " United Press " who made a tour of the cyclone affected areas of Tamluk gives a very graphic picture of the havoc caused by the tidal bore.

" Extensive damages to property and crops and appalling loss of human and animal lives have been caused by the severe typhoon which passed over Tamluk Sub-division and its neighbouring areas on October 16th last. Such calamitous devastation from the wrath of Nature has not been witnessed in this part of the country within living memory.

There was high wind, accompanied with periodical showers, from the morning of the 16th and the sky was overcast with cyclonic clouds. The wind gradually gained alarming speed after midday, and with the arrival of the flow tide in the afternoon, the rivers suddenly assumed enormous proportions and swelled up to a terrific height, engulfing all villages within ten to twelve miles from the river banks.

The water rose up five to six feet high on the river embankments and the villages on the river side were at once washed away, and men and cattle carried away like leaves on the high level of running water. The sudden deluge swept over village after village, giving the people neither time nor any means for safety.

With the approach of evening the storm with heavy torrents greatly increased in fury and ferocity and reached its peak at about 8 p.m. and continued with undiminished intensity for about the next six hours. Innumerable trees, including the biggest ones, were uprooted and fell on roads and houses. Walls and houses collapsed, burying the inmates alive. Corrugated iron and thatched roofs were blown away. The cries and screams of the dying and the terror-stricken were drowned by the infernal noise of the raging storm and dashing waves along the extended arms of the rivers.

The major portion of the area of the Sub-division covering about 660 square miles, comprising 1,600 villages with a population of about 7½ lakhs has been seriously affected. The whole area of two police stations and major portions of three police stations were inundated.

The death-rate in the villages on the river coast has been the highest due to the combined effect of flood and storm. At least 95 per cent. of the houses in almost all villages have been destroyed. The rivers, fields and all space in the countryside still present a ghastly spectacle of carcases. Everywhere, the air is hard to breathe due to offensive smell.

The destruction of cattle and other animals in all places has been phenomenal and it is apprehended that for a number of years to come, there will be no cattle for agricultural purposes and cow's milk will be a rare commodity.

In the inundated area the saline flood water has polluted the water of all tanks and rendered it unfit for drinking purposes. All grains, food-stuffs and necessities of life have been washed away or otherwise destroyed. Granaries have been buried in mud and water. Most of the shops, markets and stores have been destroyed."

Communications were thoroughly out of order for a few days. The figure for the estimated loss of life as announced in the Bengal Legislative Council on 1st March 1943 was 15,000 human lives and 60,000 cattle. The loss of life in Orissa as given by the Finance Minister of that Province was 4,000 in its northern districts.

**15. Bay storm of 27th October to 5th November 1942.**—On the morning of the 27th October, widespread rain had fallen along the Orissa-Circars coast and the upper air charts indicated a cyclonic circulation and unsettled condition in the west central Bay. In the next two days conditions over the Bay continued to be unsettled, and heavy rainfall again occurred on the north Madras coast. The district averages of rainfall were as follows:—27th, Vizagapatam 2.3" and East Godavari 4.6"; 28th, East Godavari 4.4" and West Godavari 3.9". Noteworthy individual falls in the East Godavari District were Coringa 10.5" and Cocanada 6.8" on the 27th, Peddapuram 7.5", Cocanada 8.3" and Ramachandrapuram 7.1" on the 28th. Gopalpur in Orissa had also 8.9" on the 27th. The unsettled conditions were less marked in the central Bay on the 30th but a southward shift of rainfall in the Peninsula indicated that disturbed conditions were developing in the south-west of the Bay. In the next 24 hours a depression developed there with central region near Lat. 11°N., Long. 85°E. on the morning of the 31st. This moved in a north-westerly direction was centred near Lat. 13°N., Long. 83½°E. on the morning of the 1st November. Then it curved to the north-east and was centred near Lat. 15½°N., Long. 84½°E. at 8 hrs. of the 2nd. Continuing to move in a north-easterly direction it was centred as a deep depression on the 3rd morning near Lat. 18°N., Long. 87°E. Weather deteriorated rapidly along the coast of south-east Bengal and by the afternoon the depression intensified into a cyclonic storm with its centre at 18 hrs. within a degree of Lat. 19°N., Long. 88°E. During its northward motion widespread rain was caused along the north Madras and Orissa coast with some locally heavy falls on the 31st October and 1st November, Gopalpur receiving 9" on the latter date. Continuing to move north-eastwards the storm was centred near Lat. 20½°N., Long. 90½°E. on the morning of the 4th. Rain commenced in the north-east angle of the Bay on the 3rd morning and in the next 24 hours Cox's Bazar received 12" and Noakhali 8". The storm appears to have weakened thereafter and on the afternoon of the 4th it was centred as a depression very close to the coast. It crossed the coast near Chittagong before the morning of the 5th and subsequently became unimportant.

**16. Severe Bay storm of 13th to 17th November 1942.**—A fall of barometric pressure was noticed over the whole country on the 12th morning, while pressure departures though generally below normal over northeast India, the United Provinces and the Madras coast, were appreciably low over north and southeast Bengal. The following weather reports received from aircraft flying along and off the Arakan coast on the morning of the 12th, indicated that weather was markedly unsettled over the north Andaman Sea.

No.	POSITION.		Time I.S.T.	Ht. of aircraft.	Weather.	WIND.		Sea.
	Lat. N.	Long. E.				Dir.	Speed knots.	
1	1800	9310	1030	500	Cloudy	40	30	Moderate.
2	1810	9340	1130	300	Slight drizzle	60	15	Ditto.
3	1610	9400	0930	500	Ditto	45	30	Bough.
4	1610	9300	0936	200	Light rain	45	30	Ditto.

Pressure continued to fall over the country during the next 24 hours decreasing from west to east, and by the morning of the 13th a depression, probably deep, had formed in the north Andaman Sea with centre at 8 hrs. within 100 miles of Lat. 14½°N., Long. 94½°E. It moved west-north-westwards, and developed into a cyclonic storm by the following morning when it was centred near Lat. 15½°N., Long. 89½°E. It then took a north-westerly course and was located near Lat. 17°N., Long. 88°E. on the 14th evening when squally weather and drizzles commenced along the Orissa coast. Continuing to move in a north-westerly direction, the storm intensified further and by 6 hrs. of the 15th it had become a severe cyclonic storm with its centre near Lat. 18½°N., Long. 86½°E. At 8 hrs. of the 15th the severe storm was centred near Lat. 19°N., Long. 86½°E.; the barometric pressures recorded at Puri and Gopalpur being 0.43" and 0.36" below normal respectively. Next morning it was very close to the Orissa coast near Puri. During the course of the next 24 hours it weakened into a depression and lay as a trough of low pressure along the Circars Orissa coast. It became unimportant during the 19th.

The observations given in the table below and the summary of weather conditions experienced at Puri, Cuttack and Gopalpur during the period 14th to 17th November will give an idea of the depth and intensity of the cyclonic storm:—

## PURI.

Date.	Hr. of Obsn. I.S.T.	Pressure	Pressure dep.	Wind.		Sea.	Swell.	REMARKS.
				Dir.	Force (B.S.).			
14th November 1942.	1800	29.63	-0.23	N	4	Slight	Short low	Drizzle.
	2300	29.65	-0.26	N	5	..	..	Int. sl. drizzle.
15th November 1942.	0200	29.56	-0.39	NNW	6	..	..	Int. sl. rain.
	0600	29.51	-0.39	NNW	5	..	..	Squally weather.
16th November 1942.	0847	29.52	-0.43	N	6	Bough	Average length mod.	Cont. sl. rain.
	1400	29.31	-0.57	N	9	Very high.	Long heavy.	Ditto.
	1600	29.23	-0.62	N	9	Do.	Do.	Ditto.
	1800	29.23	-0.63	N	9	Do.	Do.	Ditto.
	2300	29.17	-0.76	N	8	..	..	Ditto.
	0600	29.20	-0.61	ESE	8	..	..	Ditto.
	0847	29.53	-0.44	SSE	9	Very high.	Long heavy.	Ditto.
	1400	29.64	-0.26	SSE	8	Do.	Do.	Ditto.
	1600	29.67	-0.20	SSE	7	Do.	Do.	Ditto.
	1800	29.75	-0.13	SSE	7	Do.	Do.	Ditto.
17th November 1942.	2300	29.66	-0.09	SSE	6	..	..	Squally weather.
	0200	29.83	-0.09	SSE	4	..	..	Ditto.

## CUTTACK.

Date.	Hr. of Obsn. I.S.T.	Pressure	Pressure dep.	Wind.		Sea.	Swell.	REMARKS.
				Dir.	Force (B.S.).			
15th November 1942.	0847	29.64	-0.31	NE	6	..	..	Showers of slight rain.
	1200	29.59	-0.36	NE	8	..	..	Showers of heavy rain.
	1400	29.52	-0.36	NE	8	..	..	Ditto.
	1600	29.51	-0.34	NE	8	..	..	Cont. heavy rain.
	1800	29.52	-0.40	NE	8	..	..	Ditto.
	2300	29.41	-0.32	NE	9	..	..	Ditto.
16th November 1942.	0200	29.60	-0.30	NE	9	..	..	Showers of slight rain.
	0600	29.62	-0.27	ESE	8	..	..	Int. moderate rain.
	0847	29.75	-0.23	ESE	9	..	..	Cont. moderate rain.
	1200	29.79	-0.18	E	8	..	..	Ditto.
	1400	29.77	-0.14	ESE	7	..	..	Ditto.
	1600	29.76	-0.12	E	7	..	..	Cont. slight rain.
17th November 1942.	1800	29.82	-0.12	ESE	7	..	..	Ditto.
	0600	29.81	-0.11	E	8	..	..	Overcast.

## GOPALPUR.

Date.	Hr. of Obsn. I.S.T.	Pressure	Pressure dep.	Wind.		Sea.	Swell.	REMARKS.
				Dir.	Force (B.S.).			
15th November 1942.	0200	29.62	-0.28	NW	4	Moderate	No swell.	Slight drizzles.
	0600	29.61	-0.29	NW	5	Do.	Do.	Do.
	0847	29.60	-0.35	NNW	5	Do.	Do.	Do.
	1200	29.51	-0.47	NNW	5	Do.	Do.	Do.
	1600	29.43	-0.55	NW	6	Do.	Do.	Bald.
	1800	29.51	-0.35	NW	4	Do.	Do.	Do.
16th November 1942.	2300	29.54	-0.33	NNW	6	Do.	Do.	Int. slight rain.
	0200	29.48	-0.42	NW	6	Do.	Do.	Int. slight drizzle.
	0600	29.41	-0.35	W	7	Do.	Do.	Cont. slight rain.
	0847	29.38	-0.59	W	8	Do.	Do.	Int. moderate rain.

No observations could be recorded till routine morning observations on the 17th.

#### PURI.

- 14th November 1942 . Sky overcast and cloudy. Moderate N-ly winds. Strong gusty winds both day and night with sky overcast. Drizzles between 19 to 22 hrs. and occasional rain between 22 hrs. and midnight. Tremendous impassable inshore surf.
- 15th November 1942 . Occasional rain between midnight and 5 hrs. and continuous light rain from 5 till 8 hrs. At 8 hrs. overcast, raining, tremendous inshore surf. Wind force gradually increased amounting to strong gales with incessant rain day and night with sand blowing like storm.
- 16th November 1942 . Wind veered to SSE from 6 hrs. and strong gale winds with sand blowing accompanied with incessant moderate to heavy rain till 1930 hrs. when wind force abated and rain stopped but intermittant drizzles.

#### CUTTACK.

- 14th November 1942 . Early morning, overcast with altostratus and stratocumulus variable—changed to nimbostratus and cirrostratus before noon. By 9 hrs. the clouds again changed to stratocumulus. Severe dusty storm began at 1205 hrs. and continued up to 2400 hrs. After that rain was showery until next morning.
- 15th November 1942 . From the early morning onwards to the next day's morning, moderate to heavy continuous rain with strong gale with 40 to 45 miles speed sometimes—some small branches broken and structural damage to some old houses. Strong gale stopped all traffic on the road. A man was unable to walk. No change in direction.
- 16th November 1942 . Wind direction changed from NE to ENE. The same speed (about 50 miles) with gusts maintained up to 1200 hrs. Afterwards the wind speed as well as the rain gradually decreased. In the evening the wind speed was about 5 miles only and direction also changed to ESE. But continuous moderate rain up to 2300 hrs. in the night. Afterwards, wind as well as rain gradually decreased.

#### GOPALPUR.

- 15th November 1942 . Cb nearly covered the sky. Strong N to NNW winds coming during the day. Light drizzle began at 1215 hrs. and increased to moderate rain.
- 16th November 1942 . Sky overcast. Weather rainy. Strong NW to W winds coming throughout the day. Severe cyclone began from 12 hrs. and made widespread damage. Wind instruments blown off in the afternoon. Not possible to take readings.
- 17th November 1942 . Sky is nearly overcast. Not possible to take readings. Sand and rain entered in the office room. Instruments covered with sand. Record books are blown off.

The Chief Engineer, P.W.D., Government of Orissa, who made a tour of inspection of the affected area, mentions in his inspection report :—

"The meteorological building at Gopalpur lost its small windows, also lost the anemometer and the ladder to it and railings. The records taken here are interesting.

From 8 A.M. to 3 P.M. of the 16th November, the barometer fell 1.2". The wind velocity at 1300 hrs. and 1500 hrs. was 50 miles per hour. The instruments blew off at 1600 hrs. The wind increased to 70-80 miles per hour."

It is also seen from this inspection report that the damage was located in an arc from Puri southwestwards through Rambha, Berhampur and Chatrapur. In the Banupur vicinity (Puri district) some 15-17" of rain fell in 2

days causing damage to the railway and the road about Balugaon. Much of this rain was reported to have occurred in a short time on the 16th. Near Aska about 22" of rain fell in 3 days, at Khallikote 11" fell in 1 day and at Humma 7.5" fell on the 16th. Damage to trees mostly large *Barh* trees was conspicuous increasing from north to south. In the towns, damage to buildings, was confined practically to the roofs.

Under the influence of this storm widespread and locally heavy rain occurred in Orissa between the 14th and 16th. Some noteworthy district averages of rainfall and particularly heavy falls of 5" and above are given in the Table below :—

#### District averages.

PROVINCE AND DISTRICT.	Amount.	Date.
Vizagapatam (Madras) . . . . .	1.2	17th.
Cuttack (Orissa) . . . . .	1.9	16th.
Balasore (Orissa) . . . . .	1.7	16th.
Puri (Orissa) . . . . .	1.7, 2.8 & 1.6	15th, 16th and 17th respectively.

#### Particularly heavy falls.

STATION AND DISTRICT.	Amount.	Date.
Ichchapuram (Vizag.) . . . . .	7.6	17th.
Rajkanika (Cuttack) . . . . .	6.7	15th.
Chandbali (Balasore) . . . . .	7.8	16th.
Kakatpur (Puri) . . . . .	6.5	15th.
Gop (Puri) . . . . .	9.6	16th.
Banpur (Puri) . . . . .	9.1	17th.

The nature of the damage done and the areas affected by this storm are given in a Press Note issued by the Government of Orissa from which it appears that the area severely affected was a coastal strip about 10 miles deep along the whole length of Puri and Ganjam districts. The greatest loss of life and damage to property appear to have occurred in Berhampur and Chatrapur taluks of Ganjam district, particularly in Palur Estate. A considerable number of cattle are believed to have been killed by the cyclone. Houses including Government buildings have been severely damaged in both districts. It is reported that about 5/8 of the stocks of salt lying in the Humma Salt Factory in Ganjam district was destroyed by inundation. The damage to crops in the areas severely affected was believed to be considerable.

#### 17. Trough of low pressure between the 15th to 25th December 1942.

—The isobaric and upper wind charts on the morning of the 15th showed that a low pressure area existed in the south-west Bay to the east of Ceylon. It persisted in the south-west Bay as a well-marked trough of low pressure for the next three days. It became less marked on the morning of the 19th. Moving westwards it passed across the south of the Peninsula during the day, and lay off the Malabar coast on the 20th morning. It subsequently moved in a northerly direction and was over the north Konkan and the north Bombay Deccan on the 22nd, and over west Central India on the 23rd before it finally broke up against the Punjab-Kumaon hills on the 25th.

Under the influence of the low pressure area, fairly widespread rain occurred in southeast Madras, Mysore and the north Coromandel coast between the 15th and 19th with local heavy falls, the noteworthy amounts being Manamadura (Ramanad district) 4.6" and Ramanad 4.8" on the 19th.

Associated with the northerly movement of the wave, there were widespread showers in the south Peninsula on the 20th, in the Konkan and the Bombay Deccan on the 21st, in the north Bombay Deccan, the west Central Provinces and west Central India on the 22nd and 23rd and in the Punjab hills and the adjacent plains on the 24th. The rainfall was particularly heavy for the season in the north Bombay Deccan on the 21st.

#### II.—WESTERN DISTURBANCES.

During January and February western disturbances were generally active and caused a large excess of rainfall from north-west India to Bihar and Chota Nagpur. Despite the large number of disturbances during March to May, the associated precipitation was not much. There were comparatively fewer disturbances during October to December and most of them were feeble. One of these was however active and gave extensive rainfall in north-west India outside Gujarat towards the end of the second week of December.

A list of disturbances (forty-seven in number) together with a brief summary of the precipitation caused by them is given in the Table below. Details of individual disturbances are given in the Monthly Weather Reports of the different months.

TABLE.

Nature of precipitation caused by the western disturbances.	NUMBER OF WESTERN DISTURBANCES.											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Widespread .	5	4	3	5	2	1	0	0	0	1	1	1
Local or scattered.	2	1	1	1	7	0	0	0	0	1	1	4
Little or no rain.	2	1	2	0	0	0	0	0	0	0	0	1
No. of disturbances each month.	9	6	6	6	9	1	0	0	0	2	2	6
Total number of western disturbances during the year 1942 . 47												

The description of the most important of the disturbances, viz., that of the 18th-21st February 1942, is given in Section I under "Depression and Cyclonic Storms".

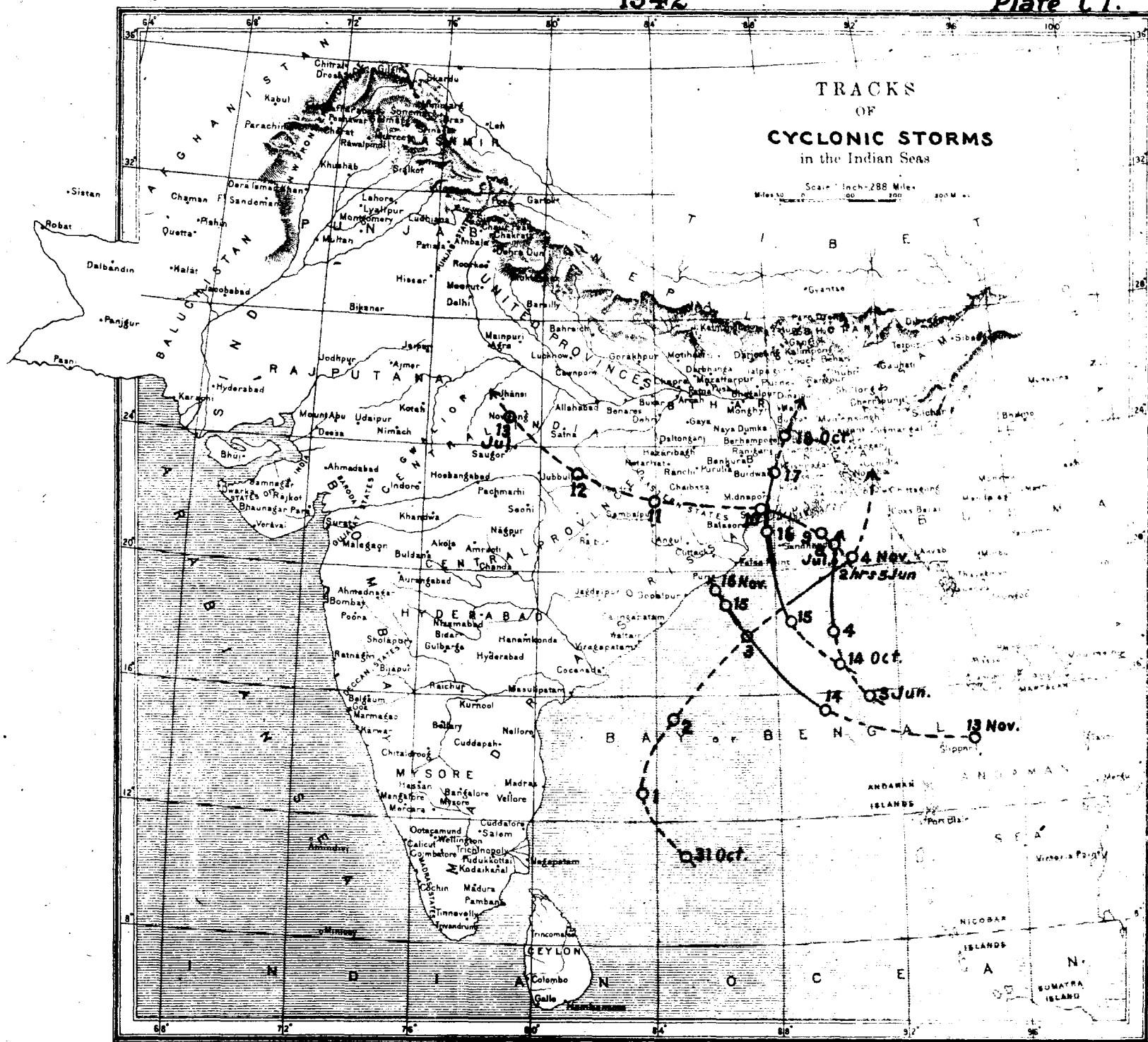
### III.—LOCAL STORMS.

Of the local storms reported in newspapers the following are noteworthy :—

Place.	Date.	Time.	Character of storm.	Loss of human life.	REMARKS.
Dinajpur (Bengal) .	January 19th .	2200	Severe hail-storm.	..	Hailstones were heaped to a thickness of about one foot at places. Much damage was caused to seasonal crops including mustard, pulse and wheat.
Tundla (U.P.) .	February 19th	1430	Violent storm .	2	Much damage was caused to Railway Station. Several houses were reported damaged and wagons in the Loco shed capsized. Seven persons were injured. The hailstorm was severe accompanied by heavy showers.
Lucknow (U.P.) .	February 21st	Afternoon.	Hailstorm .	..	Slight damage was caused to a house struck by lightning.
Burdwan (Bengal) .	March 2nd .	Evening.	Tornado .	..	A few houses were damaged and one cow was killed.
Midnapore (Bengal)	March 3rd .	Do.	Hailstorm .	..	A large number of houses were blown off and trees uprooted. About a dozen persons received injuries. Crops were partly damaged.
Sylhet (Assam) .	March 8th .	..	Ditto .	..	Four more persons injured. Animals were killed due to lightning.
Chandika (U.P.) .	March 9th .	..	Thunderstorm .	2	16 people were injured by lightning.
Bhankadi (Bengal) .	April 13th .	..	Ditto .	2	Hailstones some of the size of golf ball driven by a sixty mile gale hurried across the city for a quarter of an hour. Houses were damaged and trees uprooted.
New Delhi .	April 15th .	Afternoon.	Severe hail-storm.	..	Four persons were drowned as a result of boat sinking during the storm. A number of houses were damaged and many trees uprooted.
Tangail (Bengal) .	April 15th .	..	Storm .	4	

### III.—LOCAL STORMS—contd.

Place.	Date.	Time.	Character of storm.	Loss of human life.	REMARKS.
Darjeeling (Bengal)	April 22nd .	Afternoon.	Severe hail-storm.	..	Hailstone about 2 inches thick littered the hill-sides, roads and streets. At 3 P.M. the darkness due to dense clouds was so intense that pedestrians used torch lights to find their way.
Chandpur (Bengal)	April 28th .	..	Severe storm .	..	Many houses collapsed and big trees were uprooted. Estimated cost of damage was about Rs. 10,000.
Arrah (Bihar) .	April 29th .	Afternoon.	Duststorm .	..	It was of great intensity and was followed by a shower of hailstones generally of unusual dimensions.
Banfal (Bengal) .	April 29th .	Morning.	Severe storm .	3	The storm which lasted for about half an hour caused the Post Office and several buildings to be blown off. Three men were reported to be killed by a house fall.
Straiganj (Bengal) .	May 2nd .	Night	Heavy storm .	5	Many houses were reported damaged resulting in the death of 3 men by house collapse and two boys being cut and killed by a blown away corrugated tin sheet.
Benares (U.P.) .	May 9th .	Do.	Thunderstorm .	1	Trees were uprooted disorganising telegraphic and telephonic communications. One man was electrocuted by the fall of overhead electric wire.
Rajshahi (Bengal) .	May 11th .	2030	Heavy storm .	..	270 houses were badly damaged. No loss of life but 8 or 9 people were injured.
Kishoreganj (Bengal).	May 11th .	..	Strong gust of wind	1.	School tinsheds were blown off. One man was killed as a result of house collapse.
Natore (Bengal) .	May 11th .	Night	Storm .	..	A large number of tinsheds and some large trees were blown away. Several heads of cattle were also lost.
Muzaffarpur (Bihar).	May 11th .	Do.	Duststorm .	..	Considerable damage was done to mango and lichi crops.
Asansol (Bengal) .	May 11th .	Evening.	Severe storm .	13	Forty persons were injured due to collapse of a shed. A large number of trees were uprooted and many huts and sheds levelled to the ground.
Mymensingh (Bengal).	May 16th .	..	Heavy storm and rain.	1	Large number of old and big trees were uprooted and many houses collapsed.
Kurigram (Bengal)	May 17th .	Morning.	Severe storm .	..	Trees big and small were uprooted and big branches wrenched off from trunks and flung at considerable distances. A number of houses were damaged. One man was seriously injured.
Krishnagar (Bengal)	May 17th .	..	Heavy thunder-storm.	2	Two people were struck by the thunderbolt meeting with instantaneous death.
Comilla (Bengal) .	June 10th .	Night	Storm .	..	Kutcha houses were damaged and trees blown down.

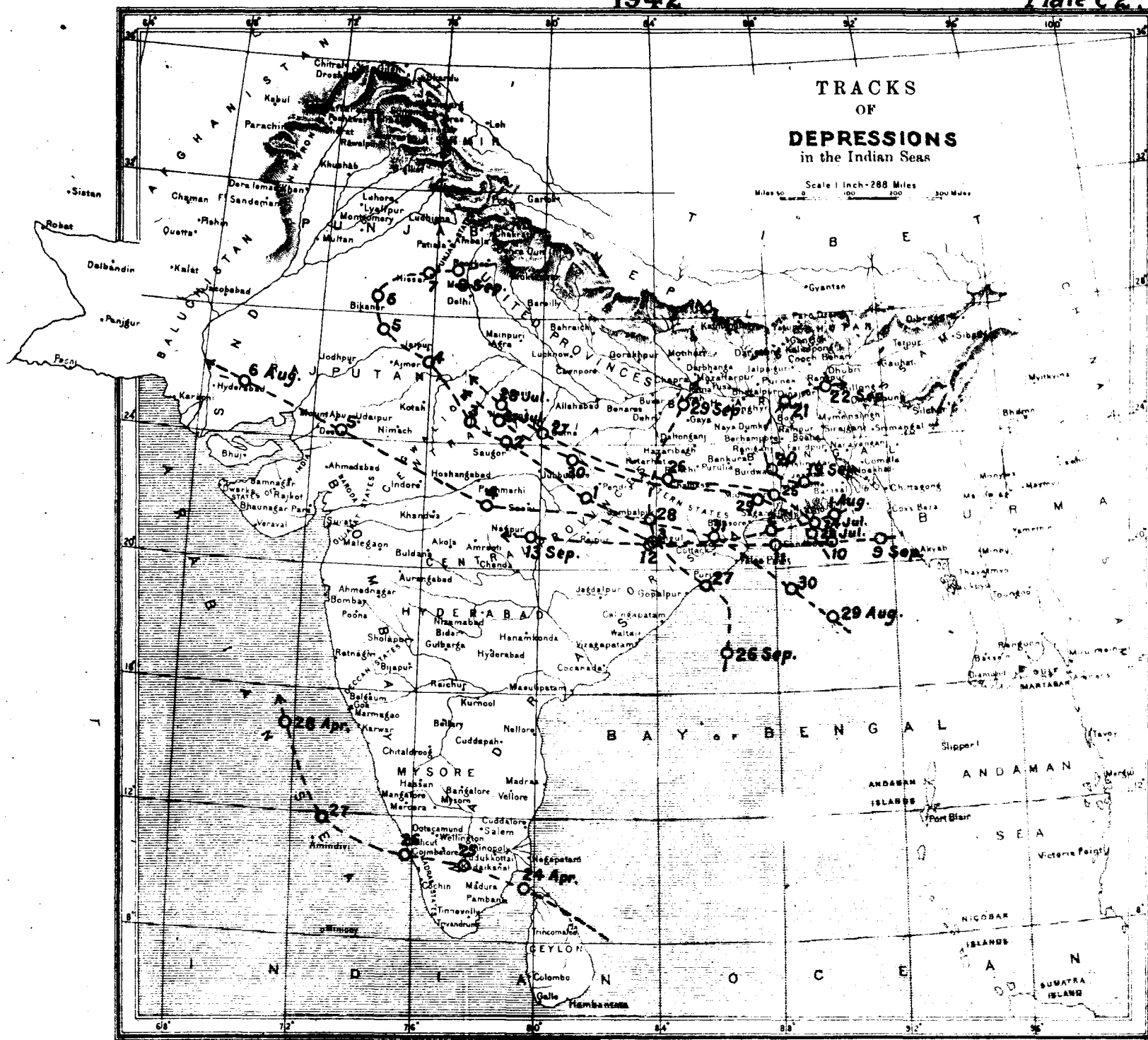


CIRCLE INDICATES POSITION OF CYCLONE OR DEPRESSION AT 8 HRS.

----- Depression

———— Storm

———— Severe Storm.



Ref. No. 1454 E 37 : 500-1,100'38-1,100'39-1,100'40-1,100'41-400'42-X'43-X'44.

ENGRAVED HELIO S I O (P. L. O.).

CIRCLE INDICATES POSITION OF DEPRESSION AT 8 HRS.